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of root development of cereals in each seems to be in true prairie 100 per cent, in mixed prairie 80–95 per cent, and in short-grass plains 51–79 per cent. The experimental data are given in the form of tables, drawings, and photographs, all of excellent quality. It is recognized that variations in root development are caused by various factors, such as the chemical and physical character of soils and the evaporating power of the air. The soil factors are most effective through water content and aeration. The water relations of the various habitats were examined by WEAVER by means of atmometers and by soil moisture determinations, the latter being interpreted by means of the wilting coefficient and hygroscopic coefficient. He calls attention to the recognized fact that many plants are able to continue to absorb water below the limits of the wilting coefficient. In fact, it is in the responses of different plants to the use of soil moisture lying between the limits of the wilting and the hygroscopic coefficients that differences appear which might be used with advantage for a most significant classification. All wilting, whether clearly manifest or not, takes place at about the same moisture content, that is, at the wilting coefficient. As the moisture passes below this point the hydromesophytes soon die, the mesophytes live for a somewhat longer time, while xerophytes or drought-resistant plants prolong their existence for a very considerable period, reducing the soil moisture to the hygroscopic coefficient. It seems rather clear from the work of ALWAY and others, however, that the water absorbed below the limits of the wilting coefficient is quite insufficient for growth and merely serves to sustain life, indicating that the term "growth water" has been correctly used by the reviewer and others for the amount of soil moisture in excess of that indicated by the wilting coefficient.

While all of WEAVER's investigations of root development have been of the highest order, this report shows a decided advance, for the accumulation of data has become sufficient to permit some significant generalizations. Among other things he points out that as our knowledge of root development in various associations increases it will render more accurate our interpretation of the indicator significance of the natural vegetation. Thus the contribution he has made to the science of ecology becomes most useful in the practice of agriculture.—GEO. D. FULLER.

Sturtevant's notes on edible plants

The purpose of this large volume,[3] as indicated in the preface, is that new knowledge may be available as follows: (1) the original home of many esculents is given for the first time; (2) new landmarks in the histories of edible plants are pointed out; (3) an effort is made to mention all cultivated esculents; (4) although the book contains much new information as to the history of the food plants of the Old World, it is especially full and accurate in the discussion of the esculents of the New World; (5) STURTEVANT presents much new information on the variations that have been produced in plants by cultivation; (6) the book adds much to geographical botany; (7) many data are contributed toward the study of acclimatization.

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[3] HEDRICK, U. P. (editor), STURTEVANT's notes on edible plants. Report N.Y. Agric. Exper. Sta. for 1919. 2:4to. pp. vii+686. Albany: J. B. Lyon Co., State printers. 1919. $2.75.

The material contained in the book was compiled from the notes and manuscripts of the late Dr. E. LEWIS STURTEVANT, first Director of the New York Agricultural Experimental Station, and represents the labors of at least a quarter of a century. The editor and his assistants have had no light task in selecting from the large mass of partially organized material, and in verifying and organizing the bibliography, which includes some 6000 citations contained in 500 publications. This task of organization seems to have been well done. The information is arrayed in encyclopedic entries under the scientific name of the plant. To further facilitate reference there is an index of common names. The articles vary in length from a few lines for many of the less important plants to six or eight pages for such plants as beet, potato, tomato, and strawberry, and twelve pages for squash, pumpkin, and corn.

A portrait of STURTEVANT, a biographical sketch, and a bibliography of his writings add to the interest of the volume. Its comprehensive nature, including reference to some 3000 plants, its close attention to historical and geographic data, and its numerous citations of literature make it invaluable for reference. It greatly expands and often corrects details of the knowledge formerly available through such works as DE CANDOLLE'S *Origin of cultivated plants*. It is excellently printed, remarkably low priced, and is available for purchase from the New York Agricultural Experiment Station, Geneva, N.Y.—GEO. D. FULLER.

Devonian floras

ARBER'S[4] posthumous volume, which was sent to the press by the deceased author's wife and his friend D. H. SCOTT, gives a very welcome general survey of the Devonian floras. There is comparatively little known of the Devonian plants, and a great deal of what was formerly attributed to Devonian turned out to be of a later geologic age. On the other hand, the great discoveries of lower Devonian plants at Rhynie in Scotland, which represent the oldest known type of land plants, had given a renewed interest to Devonian paleobotany.

ARBER divides the fossil plants of the Devonian formation into two floras. The first and older division, which he calls *Psilophyton* flora, is represented by those low pteridophytes of which some types had already been described by Sir WILLIAM DAWSON in 1859, and whose affinities have remained so doubtful. The latest addition to this group is the newly discovered plants from Rhynie.

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[4] ARBER, E. A. NEWELL, Devonian floras, a study of the origin of Cormophyta. 8vo. pp. xiv+100. *figs*. 47. Cambridge. 1921.